

26

**B**

Applications of Ultrasonics in Physicochemical Research. (In Russian.) B. B. Kudryavtsov. *Uspekhi Khimii* (Progress in Chemistry), v. 17, Mar.-Apr. 1948, p. 168-178.

Reviews methods for generating ultrasonic waves and applications, and describes typical effects resulting from exposure to them. 46 ref.

ASPH-11A METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

COMMON VARIABLES INDEX

OPEN

INTERNAL INDEX

ASPH-11A METALLURGICAL LITERATURE CLASSIFICATION

COMMON ELEMENTS

COMMON VARIABLES INDEX

OPEN

INTERNAL INDEX

KUDRYAVTSEV, B. B.

Kudryavtsev, B. B., The absorption of sound in air lighted with ultraviolet rays. P. 155.

With the help of an acoustic interferometer, the dying of sound in air and in air lighted with ultraviolet radiation is measured. The ratio of the coefficients of the absorption of sound in both cases is determined. In all 104 such ratios are determined. Statistical treatment of the results of measurement lead to the conclusion that the absorption coefficient in lighted air is somewhat smaller than the corresponding value for the non-lighted air.

June 29, 1948

SO: Journal of Experimental and Theoretical Physics (USSR) 19, No. 2 (1949)

KUDRIAVTSEV, B. B.

Kudriavtsev, B. B. and Sorokina, E. I., The propagation of the ultra sound in solutions. P. 158.

With the help of an acoustic interferometer the rates of sound in various mixtures were measured at various temperatures. The densities of the corresponding mixtures were measured simultaneously. On the basis of the obtained data the molar rates of the sound in mixtures were calculated. Calculations showed that the molar rates of sound in mixtures do not change with temperature. Within the limits of experimental errors the molar rates of sound in mixtures are an additive function of the composition of the mixture and also an additive function of the bonds in the molecules. Deviation from this rule are probably due to the formation of molecular compounds which are destroyed at increase of temperature. On the basis of the results of measurements a method of an approximation determination of molecular weights of the dissolved substances is proposed.

June 29, 1948

SO: Journal of Experimental and Theoretical Physics (USSR) 19, No. 2 (1949)

KUDRIAVTSEV, B.B.

KUDRIAVTSEV, B B. Inaudible sounds; supersonic waves. Moskva, Gos. izd-vo tekhniko-teoret lit-ry, 1950. 38 p. (Nauchno-populiarnaya biblioteka) (51-36994)

QC243.K8

CA

2

Sound absorption in gases. B. B. Kudryavtsev (Mendeleev Chem. Tech. Inst., Moscow). *Zhur. Fis. Khim.* 24, 1094-1100 (1950).—Large discrepancies between calcd. and observed sound absorption coeffs.  $\alpha$  in monat. gases are generally due not to exptl. errors but to the inadequacy of the theory taking into account solely the losses due to viscosity and heat cond. The same remark applies to diatomic gases in the range where there is no loss due to relaxation. An addnl. absorption coeff. is introduced as a consequence of the Maxwellian distribution of mol. velocities. Notations:  $\lambda$  = sound wave length,  $l$  = mean free path,  $c$  = av. mol. velocity,  $\tau = l/c$ ,  $\rho$  = mean gas d.,  $\rho_0$  = max. gas d. at a given point at zero time,  $\rho_1$  = max. gas d. after time  $\tau$  during which mol. velocities remain unchanged,  $Z$  is defined by  $\rho_1 = \rho_0 \cos(2\pi Z/\lambda)$ . During  $\tau$ , a no. of mols. passes from the region of the wave corresponding to  $Z$  to the region corresponding to  $Z + 0$ . This no. is given by  $d\rho = \rho_0 W(Z) dZ$  with  $W(Z) dZ = (1/\sigma)^{1/2} \exp(-Z^2/\sigma^2) dZ$ . If  $\sigma = Z/l$ , then  $d\rho = \rho_0 (\sigma)^{-1/2} \cos\{(2\pi\sigma/\lambda) \exp(-\sigma^2)\} d\sigma$ . After integration,  $\rho_1 = \rho_0 \exp(-\pi^2 \sigma^2/\lambda^2)$  or finally  $\rho_1 = \rho_0 \exp(-\pi^2 \tau^2/\lambda^2)$ . This defines a new absorption coeff.  $\alpha_R = \pi^2/\lambda^2$ . The following values of  $\alpha \lambda^2 \times 10^9$  cm. are given (data from literature, value calcd. by old theory, value calcd. by the present theory, resp.): A, 22, 18, 25; He, 65, 60, 68; N<sub>2</sub>, 21.5, 16.5, 22.5; air, 22.5, 16.5, 22.5; O<sub>2</sub>, 42, 18, 24.5. The discrepancy for O<sub>2</sub> may be due to relaxation. For H<sub>2</sub> and D<sub>2</sub>, the observed value is much larger than the value given by the present theory, and since relaxation is improbable in this case, new expts. are suggested. The theory outlined above is only approx. because of the simplified model used. Random d. fluctuations may have to be taken into account. Michel Boudart

KUDRYAVTSEV, B. B.

184T28

USSR/Chemistry - Energy of Gas

Feb 51

"Energy Fluctuations in an Ideal Gas," B. B. Kudryavtsev, Chemicotech Inst imeni D. I. Mendeleyev, Moscow

"Zhur Fiz Khim" Vol XXV, No 2, pp 147-152

Worked out new expressions to calc energy fluctuations in collections of small number of mols of ideal monomol gas. S. B. Gorbchayev's formula, prior to this the most complete and free of int contradictions, is applicable only to large aggregates of mols.

184T28

KUDRYAVTSEV, B. B.

Application of ultrasonic methods to research practice in physical chemistry. Moskva,  
Gos. izd-vo tekhniko-teoret. lit-ry, 1952. 323 p. (53-17044)

QC244.K8

USSR/Medicine - New Drugs  
Chemistry, Physics - Ultrasound

Apr 52

"Ultrasound," Prof B. B. Kudryavtsev, Dr Chem Sci

"Nauka i Zhizn" No 4, pp 20-23

Prof S. N. Rzhavkin has done outstanding work on the dispersion of various substances with the aid of ultrasound (e. g., Ag emulsions). This technique was particularly useful in dispersing AgBr in order to obtain highly sensitive photographic plates. USSR scientists developed a method of dispersing oil of camphor in water with ultrasound; in the form of the resulting emulsion, camphor can now be administered intravenously. In connection

with the great Communist construction works, ultrasound is now being used for testing the hardening of concrete. S. Ya. Sokolov has proposed the use of a scale model of the earth's crust for studying phenomena taking place in the earth's crust during earthquakes. The elastic wave is reduced on the same scale: by using sound waves having a frequency between several hundred thousand and several tens of million oscillations per sec, seismic phenomena and the structure of the earth can be studied with the aid of Sokolov's defectoscope. Sokolov has also designed an ultrasound microscope, which permits observation of objects surrounded by a medium that is opaque to light. Magnification by factors amounting to tens of thousands can be achieved.

221T33

KUDRYAVTSEV, B. B., Prof.

Petrov, V. B. (Prof.)

Petrov, Vasilii Vladimirovich, 1761-1834

The Russian physicist Vasilii Petrov. Znan. sila no. 5, 1952

9. Monthly List of Russian Accessions, Library of Congress, August, 1952. Unclassified.

KUDRYAVTSEV, B. B., Prof.

Stoletov, Aleksandr Grigor'evich, 1839-1896

Book about a great Russian physicist ("A. G. Stoletov." By V. Bolkhovitinov.  
Reviewed by Prof. B. B. Kudryavtsev). Znan.sila 22 No. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

KUDRYAVTSEV, B. B.

Aug 52

USSR/Chemistry - Ultrasound

"Review of B. B. Kudryavtsev's Book 'Application of Ultrasonic Methods in Practical Physicochemical Research,'" (V. F. Nozdrev, reviewer)

Zhur Fiz Khim, Vol 26, No. 8, pp 1218-1220

B. B. Kudryavtsev's "Primeneniye Ul'tr azakusticheskikh Metodov v Praktike Fiz-Khim Issledovaniy (Application of Ultrasonic Methods in Practical Physicochemical Research), Gostekhizdat, 1952, is the first Russian-language work which completely reflects achievements in the field of ultrasonics as applied to the investigation of physical and physicochemical processes. It describes work done in the USSR and abroad. The book of I. G. Mikhaylov (1949) "Rasprostraneniye Ul'trazvukovykh Voln v Zhidkostyakh" ("Propagation of Ultrasonic Waves in Liquids)," dealt only with the investigation of liquids and was therefore incomplete and one-sided. On the other hand, Kudryavtsev's book encompasses all the basic research, both theoretical and exptl, on the propagation of ultrasonic waves in gaseous, liquid, dispersed, and solid systems. It also includes a section on the application of ultrasonics in colloid chemistry.

263 T 13

KUDRYAVTSEV, B.B.; GAVRILOVA, Ye., redaktor.

[Inaudible sounds] O neslyshimyykh zvukakh. [Moskva] Izd-vo  
TsK VLKSM "Molodaia gvardiia," 1953. 148 p. (MIRA 7:8)  
(Ultrasonics)

KRAVETS, T.P., chlen-korrespondent; KUDRYAVTSEV, B.B., professor.

An outstanding Soviet physicist, P.P.Lazarev. Fiz.v shkole 13 no.3:15-  
18 My-Je '53. (MLRA 6:6)

1. Akademiya nauk SSSR (for Kravets.) (Lazarev, Petr Petrovich, 1878-  
1942)

KUDRYAVTSEV, B.B.

USSR.

✓ Molecular kinetic theory for the propagation of sound in gases. B. B. Kudryavtsev. Zhur. Fiz. Khim. 27, 1693-1701 (1958). The calculation of the effect of nonelastic collisions of gas molecules on the propagation velocity of the acoustical impulse leads to the development of an equation for sound velocity on the basis of the molecular kinetic theory which coincides with that developed by hydrodynamics. The observed dependence of the velocity on pressure at low pressures leads to the assumption that molecular complexes are formed in molecular collisions that exist for a finite period of time. The average lifetime of these complexes was calculated to be  $10^{-10}$  sec.

BB  
met

KUDRYAVTSEV, B.B., professor; KADER, Ya.M., redaktor; SRIBNIS, N.V.,  
tekhnicheskiy redaktor

[Inaudible sounds] O neslyshimyykh zvukakh. Moskva, Voen.  
izd-vo Ministerstva obor. SSSR, 1954. 107 p. [Microfilm]  
(Ultrasonic waves) (MLRA 9:2)

KUDRYAVTSEV, B.B.; DUKOV, V.M., redaktor; MAKHOVA, N.N., tekhnicheskiy redaktor

[Simple experiments with ultrasonic waves] Prostye opyty s ul'tra-  
zvukami. Moskva, Gos. uchebno-pedagog. izd-vo Ministerstva prosve-  
shcheniia RSFSR, 1954. 115 p. (MLRA 7:9)  
(Ultrasonic waves)

KUDRIYAVTSEV, B.B.

KOSHKIN, N.P., kandidat fiziko-matematicheskikh nauk.

"Inaudible sounds." B.B.Kudriavtsev. Reviewed by N.P.Koshkin.  
Znan.sila no.4:27 Ap '54. (MLRA 7:5)  
(Ultrasonic waves) (Kudriavtsev, B.B.)

KUDRYAVTSEV, B. B.

USSR/Chemistry - Physical Chemistry

Card 1/1

Author : Kudryavtsev, B. B.

Title : The speed of sound in liquids and the physico-chemical properties of liquids

Periodical : Zhur. Fiz. Khim., 28, Ed. 5, 930 - 935, May 1954

Abstract : The importance of the acoustic measurement method in the study of physico-chemical properties of liquids, in determining the nature of liquids, and in the formulation of the molecular-kinetic theory of the liquid state, is emphasised. Such measurements can be applied for the calculation of the  $\alpha$  constant in the van der Waals equation and in determining the dependence of this value upon temperature. Seven references: 3-USSR, 1-Swiss, 2-German, 1-Italian. Tables, graphs.

Institution : ...

Submitted : Oct 31, 1953

KUDRYAVTSEV, Boris Borisovich; METANIYEVA, M., redaktor; MIKHAYLOVSKAYA,  
N. tekhnicheskiiy redaktor.

[Origin of things; study of the structure of matter] Pervonachala  
veshchei; ocherk o stroenii veshchestva. [Moskva] Izd-vo TsK  
VLKSM "Molodaya gvardiia," 1955. 108 p. (MLRA 8:8)  
(Science--Juvenile literature)

KUDRYAVTSEV, B. B. and MELKONYAN, L. G.

"Velocity of Sound in Liquid Mixtures Whose Components Form Chemical Compounds", a report presented at a conference of professors and teachers of the institutes of the Ministry of Education RSFSR and published in the "Application of Ultrasonics to the Investigation of Substances," Moscow, 1955.

KUDRYAVTSEV, B. B. and DREMINA, V. P.

"Dispersion of Velocity of Sound in Certain Organic Substances", a report presented at a conference of professors and teachers of the institutes of the Ministry of Education RSFSR and published in the "Application of Ultrasonics to the Investigation of Substances," Moscow, 1955.

KUDRYAVTSEV, B. B. and SUSLOV, B. N.

"Investigation of Liquid Binary Systems With Various Natures of the Molecular Interaction of the Components", a report presented at a conference of professors and teachers of the institutes of the Ministry of Education RSFSR and published in the "Application of Ultrasonics to the Investigation of Substances," Moscow, 1955

KUDRYAVTSEV, B. B.

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium.  
Physicochemical Analysis. Phase Transitions, B-8

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 6103<sup>4</sup>

Author: Melkonyan, L. G., Kudryavtsev, B. B.

Institution: None

Title: Velocity of Sound in Liquid Mixtures the Components of Which  
Form a Chemical Compound

Original

Periodical: Sb: Primeneniye ul'traakustiki k issled. veshchestva, No 2,  
Moscow, Izd-vo MOPI, 1955, 35-59

Abstract: There were measured interferometrically the velocity ( $a$ ) of ultra-  
sound ( $10^6$  hertz) in mixtures of different concentration: aniline-  
phenol and phenol-paratoluidine ( $45^\circ$ - $60^\circ$ ), aniline-orthocresol  
( $35^\circ$ - $50^\circ$ ) and isoamyl alcohol-nitrobenzene from ( $25^\circ$ - $45^\circ$ ). It is  
shown that formation of a compound is not necessarily associated  
with an anomalous change in  $a$ . Determination of molecular velocity  
of sound ( $R = a^1/3V_m$ ;  $V_m$  -- molecular volume) does not permit

Card 1/2

USSR/Physical Chemistry - Thermodynamics. Thermochemistry. Equilibrium.  
Physicochemical Analysis. Phase Transitions, B-8

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61034

Abstract: determination of the formation of a chemical compound in the mixture. The change of  $R$  with temperature that is sometimes observed is apparently not connected with either formation of a chemical compound or molecular association. Results of measurements of sound velocity in binary mixtures and of their viscosity coefficient  $\eta$  indicate the absence of a univalent correlation between  $a$  and  $\eta$ : monotonous change in  $a$  on change in composition of the mixture can occur in conjunction with the presence of an extremum on the  $\eta$  isotherms. On the basis of acoustical measurements there have been calculated the constants  $a$  of van der Waals equation. Formation of a chemical compound in the mixture does not cause sharp changes in the magnitude of  $a$  which is due to the fact that forces of molecular interactions, in the opinion of the authors, have a different nature from that of the forces which cause the formation of a chemical compound.

Card 2/2

KUDRYAVTSEV, B. B.

Dr. Chem. Sci.

"Nuclear Fuel," Znan. Sila, No.2, 1955

Summary of article D 306429, 8 Aug 55

KUDRYAVTSEV, B.B.

STEPANOV, B.

"Origin of things." B.B.Kudriavtsev. Reviewed by B.Stepanov. Znan.  
sila no.8:27 Ag'55. (MLRA 8:11)  
(Kudr|avtsev, B.B.) (Matter)

**KUDRYAVTSEV, B.B.**

**Rate of sound propagation in liquids. Zhur.fiz.khim. 29 no.4:671-676**  
**Ap '55. (MIRA 8:8)**

**(Sound waves) (Liquids)**

KUDRYAVTSEV, B.B.

The propagation of the

energy of the mol. interaction is a

KUDRYAVTSEV, B.B., professor, doktor khimicheskikh nauk.

In the struggle for life. Znan.sila 30 no.11:6-8 N '55. (MLRA 9:1)  
(Ultrasonic waves)

KUDRYAVTSEV, B. B.

"Velocity of Sound in Pure Liquids and Liquid Mixtures," paper presented at the Second International Congress on Acoustics, Cambridge, Mass., 17-23 Jun 56.

Moscow Regional Pedagogical Institute, Moscow, USSR.

KUDRYAVTSEV, B.

"The Sounds We Cannot Hear," a book published by the Foreign Languages Publishing House, 1956, in German and English.

Deals with a new branch of science, ultrasound. The author speaks of the nature of ultra-sound and dwells in detail on the technical uses it can be put to.

Moscow News 30 June 1956

LAPP, R.E.; ANDREWS, N.L.; ASTAKHOV, K.V., professor, redaktor; KUDRYAVTSEV, B.B., professor, redaktor; KUSTOVA, A.V., kandidat fiziko-matematicheskikh nauk, redaktor.

[Nuclear radiation physics. Translated from the English] Fizika iadernogo izlucheniia. Perevod s angliiskogo. Pod red. K.V. Astakhova, B.B. Kudryavtseva i A.V. Kustovoi. Moskva, Voen.izd-vo Ministerstva obor. SSSR, 1956. 435 p. (MLRA 9:4)

(Nuclear physics) (Radiation)

NOZDREV, ~~N.P.~~ professor, redaktor; KUDRYAVTSEV, B.B., professor, redaktor.;  
ZHITOV, S.P., tekhnicheskii redaktor.

[Application of ultra-acoustics to the analysis of materials] Primenenie  
ul'traakustiki k issledovaniyu veshchestva. Moskva, Izd. MOPI. No. 3.  
1956. 211 p. [Microfilm] (MLRA 10:4)  
(Ultrasonic waves--Industrial applications)

1554 FD

514 22

✓ 6443. VELOCITIES OF SOUND IN INDIVIDUAL LIQUIDS  
AND LIQUID MIXTURES B.B. Kudryavtsev.  
Akust. Zh. Vol. 1, No. 1, 39-50 (1956) In Russian  
A thermodynamic method is carried out for the  
velocity of sound in liquids. A comparison made with  
experimental data is satisfactory. The method is  
of 40% accuracy. The method is worked out again giving  
secondary and more complex mixtures. (R. S. Manders  
Russian).

Phys

REPLYA/TSEV R R

REPLYA/TSEV: Sound speed in feet per second  
1000 feet per second  
1000 feet per second  
1000 feet per second

...and binary fluid mixtures. The theoretical computations are compared with  
experiment. The calculated values are compared with

KUDRYAVTSEV, B.B.

USSR/Acoustics - Sound Vibrations and Waves, J-2

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35537

Author: Kudryavtsev, B. B.

Institution: None

Title: Velocity of Sound in Liquids, Liquid Mixtures, and Solutions

Original Periodical: Akust. zh., 1956, 2, No 2, 167-172

Abstract: An expression is derived for the velocity of sound, containing the internal energy and certain physical characteristics of the substance. In a preceding work (Referat Zhur - Fizika, 1956, 29619) the velocity of sound was calculated from many binary mixtures of organic liquids and were compared with experimental data. An explanation was given for the observed variation in the velocity of sound with the change of concepts in concentration. In this work, the equation obtained was used to calculate the velocity of sound in water solution of electrolytes. The theoretically-computed values of velocity of sound are in good agreement with the

Card 1/2

534 22-14 2001

~~Rao's Rule and its Basis~~ p. 8

~~Kudravytsev (Akust. Zh., Oct. Dec. 1956,~~

~~Vol. 2, No. 4, pp. 331-340). Rao's~~

~~empirical relation connecting the velocity~~

~~of sound in liquids and the density of~~

~~(Indian J. Phys. April 1946, Vol. 1, No. 2,~~

~~109-116) is discarded. It is replaced by~~

~~ing eleven to Russian literature.~~

Moscow Akust. Pedagog. Inst.

KUDRYAVTSEV, B. B.  
Category : USSR/Acoustics - Ultrasound

J-4

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2153

Author : Kudryavtsev, B.B.

Title : Chemical Effects of Ultrasonic Oscillations

Orig Pub : Primeneniye ul'traakustiki k issled. veshchestva. Vyp. 3. M., MOPI, 1956, 5-29

Abstract : Survey of various physical and chemical effects of ultrasonics. The chemical effects include: oxidation, hydrolysis, reduction, polymerization, depolymerization, molecular regrouping, "aging," etc. A very important role is played in chemical effects of ultrasonics by cavitation. The oxidation of KI by sounding results from processes causing resonant oscillations of microscopic air bubbles collecting in the standing-wave regions having the maximum pressure amplitudes. This explains the existence of an optimum ultrasonic frequency with respect to chemical effects, the absence of chemical effects when individual ultrasonic pulses are applied, the separation of  $I_2$  from a KI solution first near the surface of the liquid, and other characteristic features of ultrasonic effects. Depolymerization by sounding is principally due to cavitation and probably is of physical rather than chemical nature. One of the causes of depolymerization are friction forces which tear individual macromolecules away from the micro-regions which are formed by the interlaced macromolecules and which have a gel structure. Polymerization is promoted by ultrasonics, owing to formation of free radicals observed during the sounding.

Card : 1/2

Category : USSR/Acoustics - Ultrasound

J-4

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2153

Sounding affects the magnitude of the electrode potential and the course of various electrode processes. In the case of polarized electrodes, sounding causes depolarization, reducing the overvoltage in the case of electrolytic liberation of gas. Sounding changes the range of current densities at which shining plating is obtained, the yield per unit current in electrolysis, the microstructure of the plating, the effectiveness of deuterium enrichment in electrolysis of water, etc. Sounding affects the speed of crystallization, reduces considerably the hardening time of metal, and makes the ingot more uniform. Ultrasonics accelerates the dispersion hardening of aluminum, the aging of wine, the extraction from liquids and solids, etc. Intense ultrasonic oscillations accelerate considerably the heat-exchange process. Bibliography, 111 titles.

Card : 2/2

KUDRYAVTSEV, Boris Borisovich, professor, doktor khimicheskikh nauk;  
METANIYEVA, M., redaktor; TERYUSHIN, M., tekhnicheskiiy redaktor

[Inaudible sounds.] Neslyshimye zvuki. [Moskva] Izd-vo TSK  
VLKSM "Molodaya gvardiya," 1957. 155 p. (MLRA 10:5)  
(Ultrasonic waves)

KUDRYAVTSEV, B. B.

"Use of Ultrasonic Measurements in Physico-Chemical Studies."

report presneted at the Seminar on Physics, Application of Ultrasound, 23-26  
Oct '57.

Leningrad Electro-Tech. Inst., Leningrad.

КУДРЯВЦЕВ, Б.Б.

AUTHOR: Kudryavtsev, B.B.

46-2-16/23

TITLE: The 5th Scientific Conference on applications of ultrasonics for testing materials. (Pyataya nauchnaya konferentsiya po primeneniyu ultraakustiki k issledovaniyu veshchestva) (News item)

PERIODICAL: "Akusticheskiy Zhurnal" (Journal of Acoustics), 1957, Vol.3, No.2, pp. 196-197 (U.S.S.R.)

ABSTRACT: Report on the 5th Scientific Conference on Applications of Ultrasonics for testing materials, held on January 30 to February 2, 1957 at the Moscow District Teaching Institute. More than 50 papers and communiqués presented. Two main groups of papers were devoted to the problem of sound absorption in liquids and gases and to its theoretical dependence on temperature and frequency, and to the industrial applications of ultrasonics and new methods of measurements.

Card 1/1

AVAILABLE: Library of Congress

*KUDRYAVTSEV, B.B.*  
NOZDREVA, V.F., prof., red.; KUDRYAVTSEV, B.B., prof., red.; ZHITOV, S.P.,  
tekhn.red.

[Use of ultrasonics for research in matter; papers of the convention]  
Primenenie ul'trazvukov k issledovaniyu veshchestva; trudy konferen-  
tsii. Pod red. V.F.Nozdreva i B.B.Kudriavtseva. Moskva, Izd. MOPI.  
No.5. 1957. 161 p. (MIRA 11:4)

1. Vserossiyskaya konferentsiya professorov i prepodavateley  
pedagogicheskikh institutov. 4th.  
(Ultrasonics)

KUDRYAVTSEV, B.B.

76-10-4/34

AUTHORS: Dubinina, Ye.F., Kudryavtsev, B.B.

TITLE: The Rate of Ultrasonic Propagation and the Hydration of Solutions  
(Skorost' rasprostraneniya ul'trazvuka i gidratatsiya rastvorov)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 10, pp. 2191-2199  
(USSR)

ABSTRACT: Experiments were carried out in order to explain the influence of the hydration on the sound velocity in solutions. The sound velocity in salt solutions was carried out under conditions which admit to regard the ion hydration as known. For this purpose the sound velocities in saturated aqueous solutions of barium- and potassium acetate, of sodium-salicylate and formate, as well as of isovalerianic acid calcium in a temperature range of from 15 - 55° C were determined. The hydration of the ground phase for salts at various temperatures is known. On the strength of the investigation is shown: 1.) The amount of sound velocity in the solution is sensitive only to a small extent with respect to variations in the interaction between solvent molecules and the solved substance. 2.) If the acoustic measurements are used for the investigation of the solution properties the hydrate shell

Card 1/2

76-10-4/34

The Rate of Ultrasonic Propagation and the Hydration of Solutions

with the hydrated ion or molecule cannot be considered as incompressible when the hydration is determined. In the case of such computations the compressibility of the various hydrate shells has to be estimated and taken into account in the case of further computations. For the estimation of the compressibility of the various hydrate shells the investigation of the acoustic properties of the saturated solutions which are in equilibrium with the solid phase is to be used. 3.) The acoustic measurements can be used for a precise determination of the hydration energy, if the latter is taken into account in the case of the derivation of the term for the sound velocity. Such computations demand, however, an increase of the accuracy of determination of the sound velocity by 1 - 2 orders by experimental way. 4.) The adiabatic compressibility is more sensitive than the sound velocity to the variations of the interaction in the solutions. There are 7 figures, 1 table, 7 Slavic references.

ASSOCIATION:

Moscow Oblast Institute for Pedagogics (Moskovskiy oblastnoy pedinstitut)

SUBMITTED:

May 4, 1956

AVAILABLE:

Library of Congress

Card 2/2

KUDRYAVTSEV, B. P.

"Application of Ultrasonic Measurements to Study of Liquids."

paper presented at the 4th All-Union Conf. on Acoustics, Moscow, 26 May - 2 Jun 58.

KUDRYAVTSKY, Boris Borisovich, prof., doktor khim.nauk; KADER, Ya.M.,  
red.; GAVRILOVA, A.M., tekhn.red.

[Inaudible sounds] O neslyshimyykh zvukakh. Izd.2., dop. Moskva,  
Voen.izd-vo M-va obor. SSSR, 1958. 143 p. (MIRA 12:3)  
(Ultrasonics)

KUDRYAVTSEV, B. B.

"Investigation of Phenomena Accompanying the Propagation of Ultrasound and Methods to be used in Work in this Field: The Dispersion Effect Produced by Cavitation."

report presented at the 6th Sci. Conference on the Application of Ultrasound in the investigation of Matter, 3-7 Feb 1958, organized by Min. of Education RSFSR and Moscow Oblast Pedagogic Inst. im N. K. Krupskaya.

KUDRYAVTSEV, B. B.

"The Effect of Resonance Phenomena on the Propagation of Sound,"

Report presented at the 6th Sci. Conference on the Application of Ultrasound in the Investigation of Matter, 3-7 Feb 58, Moscow, organized by Min. of Education RSFSR, and Moscow Oblast Pedagogic Inst. im N. K.Krupskaya

24(1)

PHASE I BOOK EXPLOITATION

SOV/2178

Kudryavtsev, Boris Borisovich, Professor

O neslyshimyykh zvukakh (Inaudible Sounds) 2nd ed., enl., Moscow, Voenizdat, 143 p. (Series: Nauchno-populyarnaya biblioteka) No. of copies printed not given. 1958

Ed.: Ya. M. Kader; Consultant of Publishing House: L. G. Merkulov, Docent;  
Tech. Ed.: A. M. Gavrilova.

**PURPOSE:** This book is intended for the general reader interested in the study of sound, particularly ultrasonics.

**COVERAGE:** This booklet discusses sounds beyond the perception of the human ear, i.e., ultrahigh frequency waves. It treats the characteristics and applications of ultrasonics as well as the methods of generating them. The author explains the principles of sound phenomena, discusses the first uses of ultrahigh frequency waves, the effect of ultrasonic waves on living organisms, the inter-relationship between sound and chemistry, the use of ultrasonic waves for precision measurement and control, other practical applications of ultrasonics, and the principles and design of an ultrasonic microscope. A supplement

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provides detailed instructions on how to build a simple ultrahigh frequency generator. The following scientists are mentioned as having made contributions in the field of ultrasonic research: V.L. Levshin, S.N. Rzhevkin, S.V. Gorbachev, A. B. Severnyy, S.Ya. Sokolov, Inventor of a reflection defectoscope, and F.K. Gorkiy and V. I. Yefremov who in 1953 discovered that ultrahigh frequency waves will accelerate ageing not only in liquids but in solids. There are 18 Soviet references.

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8-19-59

KUDRYAVTSEV, B. D.

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PHASE I BOOK EXPLOITATION

SOV/1211

Nozdrev, Vasilii Fedorovich

Primeneniye ul'traakustiki v molekulyarnoy fizike (Application of Ultrasonics in Molecular Physics) Moscow, Fizmatgiz, 1958. 456 p. 5,000 copies printed.

Eds.: Suslov, B.N., and Ye.B. Kuznetsova; Tech. Ed.: Murashova, N.Ya.

**PURPOSE:** This book is intended for post-graduate research students and students of advanced courses in the field of molecular physics and acoustics. It may also serve as an aid to engineers and technicians in different branches of industry.

**COVERAGE:** This book deals with the physical principles of the optical and impulse methods of measuring the velocity and coefficient of absorption of ultrasonic waves in liquids and gases. Special attention is given to apparatus and methods of measuring the velocity and coefficient of absorption of ultrasonic waves in liquids and their vapors at high temperatures and pressures, including the critical region. Tables of acoustic properties, constants, and parameters of many substances are included. Research data from Soviet institutions, foreign institutions and individual scientists which have a dir-

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ect bearing on the subject matter of this book are given, including the results of the Second International Congress on acoustics held in the USA in June 1956. The author states that this book is not a complete survey, but that it presents the results of many years of work by personnel of the Laboratoriya molekulyarnoy akustiki MOPI (Laboratory for Molecular Acoustics of the Moscow Oblast Pedagogical Institute imeni N.K. Krupskaya) and part of the work by the Faculty of Molecular Physics of Moscow State University, headed by A.S. Predvoditelev, Corresponding Member, Academy of Sciences, USSR. The author states that there are three works in the Russian language which give complete data on developments in ultrasonics up to 1950. They are: "Rasprostraneniye ul'trazvukovykh voln v zhidkostyakh" (Propagation of Ultrasonic Waves in Liquids), by I. Mikhaylov; "Primeneniye ul'trazvukovykh metodov v praktike fiziko-khimicheskikh issledovaniy" (The Use of Ultrasonic Methods in Practical Physicochemical Investigations), by B. Kizryavtsev; and "Ul'trazvuk" (Ultrasonics), by L. Bergmann) the latter a translation from German. The author thanks his teacher, Professor A.S. Predvitelev, for discussions on the most difficult problems of molecular acoustics; Professor S.Ya. Sokolov, Corresponding Member of the Academy of Sciences, USSR, Professor S.N. Rzhavkin, N.K. Semenchenko

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Application of Ultrasonics (Cont.)

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and B.B. Kudryavtsev for carefully reviewing the manuscript; and Candidates of Sciences N.I. Koshkin, L.F. Lependin, V.F. Yekovlev, N.A. Dmitriyeva, post-graduate student V.M. Kovaleva, and L.G. Belinskaya for assistance in preparing the manuscript for publication. There are 280 references, of which 178 are Soviet, 1 Dutch, 64 English, 14 French, 21 German and 1 Scandinavian.

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NOZDREV, V.F., prof., red.; KUDRYAVTSEV, B.B., prof., red.; ZHITOV, S.P.,  
tekh. red.

[Application of ultrasonics to research on materials; papers of  
the convention. No.4. No.6.] Primenenie ul'traakustiki k issle-  
dovaniyu veshchestva; trudy konferentsii. Pod redaktsiei V.F.  
Nozdreva i B.B. Kudriavtseva. Moskva, Izd. MOPI, No.4. 1957.  
219 p. No.6. 1958. 239 p. (MIRA 11:10)

1. Vserossiyskaya konferentsiya professorov i prepodavateley  
pedagogicheskikh institutov. 4th.  
(Ultrasonics) (Chemistry, Physical and theoretical)

NOZDREV, V.F., prof., red.; KUDRYAVTSEV, B.B., prof., red.; ZHITOV, S.P.,  
tekhn.red.

[Application of ultrasonics to research on materials; papers of the  
conference] Primenenie ul'traakustiki k issledovaniyu veshchestva;  
trudy konferentsii. Pod red. V.F. Nozdreva i B.B.Kudriavtseva.  
Moskva, Izd.MOPI. No.7. 1958. 283 p. (MIRA 12:2)

1. Vserossiyskaya konferentsiya professorov i prepodavateley  
pedagogicheskikh institutov, 4th.  
(Ultrasonics)

S/124/60/000/006/008/039  
A005/A001

Translation from: Referativnyy zhurnal, Mekhanika, 1960, No. 6, p. 39, # 7093

AUTHOR: Kudryavtsev, B.B.

TITLE: The Application of Measurements of Sound Absorption to Investigations of Liquids ✓

PERIODICAL: Tr. Seminara po fiz. i primeneniyu ul'trasvuka, posvyashch. pamyati prof. S. Ya. Sokolova. Leningrad, 1958, pp. 146-164

TEXT: The author gives a review of the works dealing with the utilization of measurements of sound absorption for studying the physico-chemical features of liquids. The sound absorption coefficient  $\alpha$  is composed of coefficients caused by the shear viscosity, the secondary viscosity, and the heat conductance. In absence of dispersion, the absorption is proportional to the square of the frequency. The deviation from this law is ascribed usually to relaxation phenomena (for example, chemical reactions). The theory relates the maximum value of the absorption coefficient, calculated for the wavelength  $\mu_{\max} = \alpha \lambda$ , to the value of  $\omega_{\max} \tau$ , where  $\omega_{\max}$  is the frequency, for which the maximum is stated, and  $\tau$  is the relaxation time of the process causing the secondary viscosity. This

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The Application of Measurements of Sound Absorption to Investigations of Liquids

latter value is also determined by measuring the correlation  $\alpha(\omega)$ . The author notices that difficulties are encountered in this way, which are often circumvented by insufficiently founded assumptions; as an example, it had been assumed that the part of absorption residual after elimination of the absorption caused by the shear viscosity and the heat conductance, has necessarily relaxation nature; often also the state is complicated by the fact that several relaxation processes may occur in a liquid. Assumptions have to be made on the mechanism of the reaction, which corresponds to the relaxation process, when determining quantitatively the thermodynamic characteristics. The author dwells upon the analysis of the works, in which the equilibrium was studied between the rotary isomers in liquids: acrylaldehyde, triethylamine, and others, and also between other isomeric forms. In some works the relaxation was studied in connection with the inhibition of the excitation of molecular oscillations (methylene chloride, benzene, carbon disulfide, and others). Moreover, relaxation processes in solutions are considered and data on these processes, which were obtained by measuring the ultrasound absorption. There are 47 references.

Yu.R.

Translator's note: This is the full translation of the original Russian abstract.  
Card 2/2

AUTHORS: Balyan, S. A., Kudryavtsev, B. B. SOV/156-58-2-6/46

TITLE: Sound Propagation in a Liquid Mixture Whose Components Form a Chemical Compound (Rasprostraneniye zvuka v zhidkoy smesi, komponenty kotoroy obrazuyut khimicheskoye soyedineniye)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Khimiya i khimicheskaya tekhnologiya, 1958, Nr 2, pp. 224-228 (USSR)

ABSTRACT: The sonic velocity in liquids is correlated by a certain dependence with some physical and chemical properties (Ref 1). Therefore it can be expected that the velocity of sound will anomalously change in liquids whose composition, as ~~mentioned in~~ **the title**, will change too. On the curve describing the sound velocity versus composition function points are to be expected corresponding to the composition of the compound to be formed. Data in publications differ (Refs 2-6). So, the authors selected mixtures of acetic anhydride, water and ethanol because these components form a compound which either does not at all dissociate or if this occurs it forms products differing from the initial components. The velocity of sound was determined optically (Ref 7) according to the observed diffraction of light by an ultrasonic grating. Reference 1

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Sound propagation in a Liquid Mixture Whose Components Form a Chemical Compound

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shows the variation of the sonic velocity  $c$ , the density and viscosity  $\eta$  in a mixture of acetic anhydride and water depending on the composition. In this case all curves show a normal course marked by 2 important points: a) The anomaly of the 1. point corresponds to a maximum in the left half and does not entail chemical compounds. This climax is explained by the peculiar structure of the water. According to the writers' opinion, the maximum in curves illustrating the variation of density and viscosity goes **back** to the same causes. The 2. point which corresponds to a mixture of an equimolar composition is apparently caused by the formation of a compound of both components. These facts were corroborated by measurements of the 2. system: Acet-anhydride-ethanol (Table 2). Based upon acoustic measurements the authors computed a correction caused by the interaction-energy of the components of mixtures. It is proportional to the molar percentage of the formed compound. The molecular sonic velocity is modified linearly by the composition of the mixture. The formation of a chemical compound composed of the mixture components does not exercise an influence on the additive proper-

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Sound propagation in a Liquid Mixture whose Components Form a Chemical Com-  
pound

NOV/156 30-3-6, 48

ties of the molecular sonic velocity. There are 5 figures  
and 2 references, 7 of which are Soviet.

ASSOCIATION: Kafedra obshchey fiziki Moskovskogo oblastnogo pedagogicheskogo  
instituta  
(Chair of General Physics of the Pedagogic Institute of the  
Moscow Oblast)

RECEIVED: November 11, 1957

Card 3/3

AUTHORS: Kudryavtsev, B. B., Balyan, S. A. SO7/156-58-4-2/49

TITLE: Connection Between the Solution Viscosity and the Sound Velocity in the Solution (Svyaz' ~~mezhdu~~ vyazkost'yu zhidkosti i skorost'yu zvuka v ney)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 617-620 (USSR)

ABSTRACT: A quantitative connection is found between the solution viscosity and the sound velocity in the solution. The results are expressed in equation (6):

$$\lg \eta = A + 1/2 \lg M + 3/2 \lg T - 2/3 \lg V - 2 \lg c + B \cdot T^{-1} \cdot c^2 \quad (6)$$

In equation (6) (A) and (B) are constants. The connection between the viscosity and the sound velocity was investigated in 19 different liquids; it is given in figures (1) and (2). Equation (8) is suggested for the calculation of the viscosity coefficient:

$$\eta = A_0^{4/3} T^{1/2} \left( \frac{c^2}{e^{\frac{1}{\eta \cdot T \cdot c}} - 1} \right). \quad (8)$$

Card 1/2 It was experimentally found that between sound velocity

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Connection Between the Solution Viscosity and the Sound Velocity in the Solution

and temperature there exists a linear dependence:

$$c = c_0 (1 + \alpha_0 \cdot t). \quad (12)$$

By equation (14) the authors show that between sound velocity and viscosity in the liquid the following connection exists:

$$\frac{\text{const}}{\eta} + A = B(c_0 - c) \quad (14)$$

in which  $A = \omega - V_0$  and  $B = \frac{V_0}{3c_0}$ .

There are 2 figures and 8 references, 3 of which are Soviet.

ASSOCIATION: Kafedra obshchey fiziki Moskovskogo oblastnogo pedagogicheskogo instituta (Chair of General Physics at the Moscow ~~Glavst~~ Institute of Pedagogy)

SUBMITTED: June 11, 1958

Card 2/2

KUDRYAVTSEV, B. B.

46-4-2-20/20

AUTHOR: Kudryavtsev, B.B.

TITLE: Sixth Scientific Conference on Application of Ultra-Acoustics to the Study of Matter (Shestaya nauchnaya konferentsiya po primeneniyu ul'traakustiki k issledovaniyu veshchestva)

PERIODICAL: Akusticheskiy Zhurnal, 1958, Vol IV, Nr 2, p 207 (USSR)

ABSTRACT: Complete translation. Sixth Conference on Application of Ultra-Acoustics to the Study of Matter was held on **February 3-7, 1958** and was organized by the Ministry of Education of the Russian F.S.S.R. and Moscow Regional Pedagogical Institute imeni N.K. Krupskaya. About 80 papers were read at this conference. Professor F. Kuchera described work on molecular acoustics in Poland. A considerable portion of papers dealt with theoretical problems of molecular acoustics such as: study of the critical state using acoustical methods (V.F. Nozdrev); microstructure of sound (M.I. Shakhparonov, L.V. Lashina); effect of resonance phenomena on propagation of sound (B.B. Kudryavtsev); effect of internal electro-magnetic fields on propagation of ultrasound in electrolytes (A.S. Predvoditelev); relationship between the structure of glass and its adiabatic

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Sixth Scientific Conference on Application of Ultra-Acoustics to the Study of Matter

compressibility (V.V. Tarasov); distribution of ultrasound in ferromagnetics (N.S. Akulov); relaxational theory of non-linear effects (Ye. V. Stupochenko, I.P. Stakhanov); absorption of ultrasonic waves of finite amplitude (L.K. Zarembo); effect of fluctuations on diffractive image (L.A. Chernov); theory of an ultrasonic interferometer (S.N. Rzhevkin); distribution of ultrasound at low pressures (N.I. Perepechko); calculation of absorption in gases (A.A. Senkevich); propagation of ultrasound in a Van der Waals gas (A.A. Kasparyants); theory of distribution and absorption of sound in acetates (B.A. Belinskiy) etc. A large number of papers reported experimental observations of peculiarities of ultrasound propagation: in reacting mixtures (S.A. Balyan); in electrolytic solutions (R.F. Kanatova); in suspensions (R.T. Tennikova); binary mixtures (T.V. Klevtsova); ternary mixtures (A.S. Shilyayev); deuterated compounds (I.B. Rabinovich); near the region of freezing of liquids (N.F. Otpushchennikov); in nitrogen at pressures up to 1000 kg/cm<sup>2</sup> (M.P. Valarovich, D.B. Balashov); in liquids at pressures up to 2000 atm

Card 2/5 (L.F. Vereshchagin, N.A. Yuzevovich); in saturated water vapour

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Sixth Scientific Conference on Application of Ultra-Acoustics to the Study of Matter

(V.I. Avdonin); in barium titanate ceramic (I.V. Bushev); in coal (A.K. Matveyev, E.G. Martynov); in ethyl alcohol vapours (K.T. Akhmetzyanov, M.G. Shirkevich) etc. Lively discussions were held on the problem of absorption of sound: in acetates (I.G. Mikhaylov, N.I. Koshkin, V.S. Lutovinov, V.F. Nozdrev, O.A. Starostina); in the critical region (B.I. Kal'yanov); in quartz monocrystals (L.G. Merkulov, E.S. Sokolova); in the region of the transition liquid--crystal (M.G. Gorbunov, N.I. Koshkin) etc. Some of the papers dealt with the problems and phenomena related to propagation of ultrasound: interferometer theory (V.I. Ilgunas, E.P. Yaronis); behaviour of cavitation bubbles (A.V. Kustova); pulse method of absorption measurement (B.I. Kal'yanov); use of multiple reflection in the study of liquids (A.D. Zipir, V.F. Yakovlev); interferometric measurements at high temperatures (Yu. S. Trelin); comparison of direct and acoustic measurement of heat capacity (Kh. I. Amirkhanov, A.I. Kerimov, A.I. Alibekov); application of ultrasound to the study of electric discharges on cavitation (V.I. Skorobogatov); dispersing action of cavitation

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Sixth Scientific Conference on Application of Ultra-Acoustics to the Study  
of Matter

(B.B. Kudryavtsev); making ultrasonic fields visible (V.I. Makarov); certain problems of testing for defects (I.N. Yermolov); effect on ferromagnetic properties of substances (A.V. Kerenskiy, V.S. Cherkashin, A.I. Drokin); transmission of centimetric electromagnetic waves through an ultrasonic grating (M. Gershenson) etc. Great interest was shown in the papers on practical applications of ultrasound: removal of corrosion from metals (L.B. Pirozhnikov); acceleration of dyeing of artificial fibres (G.V. Goryachko, N.A. Dmitriyeva, N.I. Larionov); determination of pressure in saturated plastic petroleum products (G.V. Cherchenko, V.M. Nikolayev, E.G. Bezrukov, V.I. Belousov); crystallization temperature of paraffin (A.V. Savinikhina); the effect in electrochemical processes (F.I. Kukoz); intensification of absorption (V.I. Dal', N.N. Mal'tsev); effect of food products (A.I. Zolotova); improvement of seam in electric welding (L.F. Lependin); coagulation of aerosols (N.P. Mednikov); deposition of suspensions (A. Ye. Bazhanova); effect on distribution of metal in electro-deposition (A.I. Trofimov) etc.

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Sixth Scientific Conference on Application of Ultra-Acoustics to the Study  
of Matter

A special session was devoted to demonstration experiments in acoustics (A.S. Mel'nikov) and teaching of musical acoustics in schools (K. Ye. Baranov). Lively discussions during the conference made it possible to elucidate disputable problems and to indicate methods for their solution. The number of papers on applications was larger than at previous conferences.

Card 5/5 1. Sound—Applications—Conference

KUDRYAVTSEV, B.B.; RZHEVKIN, S.N.

Fifth seminar on acoustics in Olaszyn. Akust,zhur. 4 no.4:  
376 O-D '58. (MIRA 11:12)

(Sound)

SOV/58-59-5-11505

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 5, p 227 (USSR)

AUTHOR: Kudryavtsev, B.B.

TITLE: The Velocity of Sound Propagation in Suspensions

PERIODICAL: V sb.: Primeneniye ul'traakust. k issled. veshchestva. Nr 7, Moscow, 1958, pp 17 - 25

ABSTRACT: Using an interferometer, the author measured the velocity of sound in the following concentrated suspensions:  $\text{SiO}_2$ ,  $\text{CaCO}_3$ ,  $\text{CaSO}_4 \cdot 0.5\text{H}_2\text{O}$ ,  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ , and  $\text{NaCl}$ , which had been obtained on the base of liquid mixtures, the specific weight of which was equal to that of the pulverized solid body. The author calculated this velocity on the assumption that interaction between the liquid medium and the solid phase is absent, and that when the composition of the investigated mixtures is expressed in volumetric fractions, the adiabatic compressibilities are additive. The results of this calculation agree satisfactorily with experiment in the case of all the above-mentioned suspensions except  $\text{NaCl}$ . The theoretically calculated velocities of

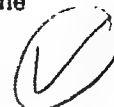
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The Velocity of Sound Propagation in Suspensions

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sound in suspensions of NaCl diverge considerably from those found experimentally. This divergence can be explained either by intensive surface interaction between the solid particles and the liquid, or else by the emergence of the structure which is observed in this suspension.

B.B. Kudryavtsev



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SOV/58-59-4-9081

24.1800

Translation from: Referativnyy Zhurnal Fizika, 1959, Nr 4, pp 243 - 244 (USSR)

AUTHOR: Kudryavtsev, B.B.

TITLE: Propagation of Sound in Liquids <sup>21</sup>

PERIODICAL: V sb.: Primeneniye ul'traakust. k issled. veshchestva, Nr 7, Moscow, 1958, pp 257 - 268

ABSTRACT: On the basis of analyzing the molecular structure of a liquid, the author demonstrates the existence in it of molecular associated complexes capable of bringing about vibrations whose frequencies are close to those of ultrasonic vibrations. The existence of molecular complexes may cause a dispersion of the velocity of ultrasonic waves that is similar to the anomalous dispersion in the optics. The excitation of the vibrations of the molecular resonators causes an extra absorption of sound, which, for frequencies far from those of the natural vibrations of the resonators, is proportional to the square of the frequency of the sound, as well as the absorption due to displacive viscosity. The energy absorbed by the resonators may not manifest itself in a rise in temperature for some time. In the region of frequencies close to those of the natural

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Propagation of Sound in Liquids

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vibrations of the molecular vibrators, one will probably observe an anomalous absorption which is qualitatively reminiscent of absorption due to relaxation phenomena but which permits the resolution of individual absorption regions that are contiguous to one another. The bibliography contains 14 titles.

B.B. Kudryavtsev

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*Kudryatsev, B.B.*

*USSR*

1. Following are titles and authors of some of the papers to be presented at subject Congress:

AKHIEZER, A. A., Acoustics Institute, USSR Academy of Sciences, Moscow - "Resonant-cylindrical transducer radiating along the axis"

AKHIEZER, I. I., Acoustics Institute, USSR Academy of Sciences, Moscow - "Some questions of non-linear acoustics"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Non-linear Acoustics, Moscow College Institute for Pedagogics - "Sound dispersion in a liquid mixture, the components of which form a chemical compound"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "Partial modeling of elastic bodies in the acoustic field and their acoustic diffraction"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "On the regulation of characteristics of the auditory system"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "On the statistical reverberation theory"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "Study of magnetically exact sound transducers from ferrites"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "Acoustic micromechanics"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "Study of the dynamic characteristics of noise measurement devices and problems of soundproofing them"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "Experimental investigation of sound scattering in the atmosphere"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "Some questions of non-linear acoustics in liquids"

AKHIEZER, I. I., and KUDRYATSEV, B. B., Laboratory for Pedagogics, USSR Academy of Sciences, Leningrad - "Sound dispersion in liquids"

Source from the Program and Information Circular, reports to be submitted for the Third All-Union Congress on Acoustics, 1979, Stuttgart, GFR, 1-6 May 1979.

(P. 300) (cont.)

KuDRYAVTSEV, B. D.

PHASE I BOOK EXPLOITATION SOV/3352

Vserossiyskaya konferentsiya professorov i prepodavateley pedagogicheskikh institutov.

Primeneniye ul'trazvukustiki k issledovaniyu veshchestva; trudy konferentsii, vyp. 8 (Application of Ultrasonics in the Study of Matter; Transactions of a Conference, Nr. 8) Moscow, Izd. MOPI, 1959. 170 p. 1,000 copies printed.

Tech. Ed.: S. P. Zhitov.

PURPOSE: The book is intended for physicists, particularly those specializing in the field of ultrasonics.

COVERAGE: This is a collection of 12 articles dealing with problems of acoustics, ultrasonics, and molecular physics. References are given at the end of each article.

Prudvodel'tev, A. S. Dispersion of Acoustic Waves in Rarefied Gases. Article 1. 19

Zipic, A.-D., and V. P. Yakovlev. Pulse Method for Multiple Transformation of an Ultrasonic Signal in the Investigation of Liquid Media 63

Ilgunas, V., and E. Yaronis. On the Theory of Interferometers with Variable and Constant Length 67

Trelin, Yu. S. Some Results of Measurement of Ultrasonic Velocity in Gases by the Pulse Method 75

Volarovich, M. P., and D. B. Palashov. Investigation of Ultrasonic Velocity in Nitrogen Under Pressures up to 1050 kg/sq cm 83

Akhmetzyanov, K. O., and M. O. Shirkavich. Ultrasonic Velocity in Compressed Vapors of Ethyl Alcohol and Determination of Heat Capacities  $C_p$  and  $C_v$  93

Perepeshko, I. I. Ultrasonic Propagation in Rarefied Gases 103

Kuchera, P. On Some Conditions for Applicability of Raoult's Law for Solutions 115

Shilyayev, A. S., and B. B. Kudryavtsev. Ultrasonic Velocity and Surface Tension in Ternary Liquid Systems 121

Bessonov, M. B. Measuring Ultrasonic Velocity and Absorption in Solutions at High Temperatures 137 15

SV/342

SV/342

Vsesoyuznaya konferentsiya professorov i prepodavateley pedagogicheskikh institutov.

Primeneniye ultrazvukov v issledovaniyakh veshchestv; trudy konferentsii, 1979. 9 (Application of Ultrasonics in the Study of Substances, No. 9) Moscow, Izd. MFTI, 1979. 265 p. Krata aliip inserted. 1,000 copies printed.

Red.: V. P. Kudryavtsev, and B. B. Kudryavtsev, Professor.

NOTE: This collection of articles is intended for scientists specializing in ultrasonics, and for those interested in the application of ultrasonics to the study of the properties of materials, and to the quality control of mechanical parts and structural elements.

CONTENTS: The collection constitutes the transactions of the All-Russian Conference of Professors and Teachers of Pedagogical Institutes. The articles report on recent theoretical and experimental investigations in the field of ultrasonics and discuss the application of ultrasonics to the study of

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# Application of Ultrasonics (Cont.)

SV/342

Kudryavtsev, A. V. and L. G. Melnikova (Krasnodarskiy politekhn. inst. [Krasnodar Polytechnical Institute]). Dependence of Speed of Ultrasonic and Certain Physical Properties of Liquid Binary Systems on Their Composition and Temperature 71

Kudryavtsev, B. P. (Kursk Pedagogical Institute). Speed of Ultrasonic with Near-Solidification Temperatures in Certain Organic Substances 83

Kudryavtsev, M. A. (Moscow Oblast' Pedagogical Institute imeni Krasnaya). Measurement of Absorption of Ultrasonic Waves in Organic Liquids in the Liquid-Crystal Transition Region 95

Kudryavtsev, A. V. and B. B. Kudryavtsev. (Moscow Oblast' Pedagogical Institute imeni Krasnaya). Investigation of the Behavior of Crystalline Solids 107

Kudryavtsev, M. S. (Krasnodarskiy politekhn. inst. [Krasnodar Institute]). Problem of the Relaxation Mechanism in Butyl Acrylate Dinitrate 117

# Application of Ultrasonics (Cont.)

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Kudryavtsev, A. P. (Kursk. Ped. inst. imeni Lomonosova [Moscow Pedagogical Institute imeni Lomonosova]). Echo-Figures in Turbidimetric Measurements of Crystals 125

Kudryavtsev, A. P. and V. Ye. Zaslavskaya (Moscow Pedagogical Institute imeni Lomonosova and I-T Ural'skiy inst. [Institute of Crystallography of the Academy of Sciences, USSR]). Effect of the Vibration of Vessel Walls on Crystallization in Thin Layers 127

Kudryavtsev, L. I., A. I. Dmitriyev, and V. S. Chumachenko (Krasnodarskiy politekhn. inst. [Krasnodar Pedagogical Institute], Krasnodar). First Results of the Study of the Properties of Ultrasonic in the Field of Ultrasonics (USSR). Effect of Ultrasonic on the Magnetic Properties of Ferromagnetic 131

Kudryavtsev, B. B., A. S. Melnikov, and A. P. Kudryavtsev (Moscow Oblast' Pedagogical Institute imeni Krasnaya). Effect of Ultrasonics on the Luminescence of Phosphors 139

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KUDRYAVTSEV, B.B.

KUDRYAK ISEU, B. B.

24(3)	PHASE I BOOK EXPLANATION	307/2809
	Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk	
	Termodinamika i stroeniye rastvorov: trudy soveshchaniya... (Thermodynamics and Structure of Solutions; Translations of the Conference Held January 27-30, 1958) Moscow, Izd-vo AN SSSR, 1959. 295 p. 3,000 copies printed.	
	Ed.: M. I. Shakhparonov, Doctor of Chemical Sciences; Ed. of Publishing House: M. G. Yegorov; Tech. Ed.: T. V. Polyakova.	
	PURPOSE: This book is intended for physicists, chemists, and chemical engineers.	
	CONTENTS: This collection of papers was originally presented at the conference on the Thermodynamics and Structure of Solutions sponsored by the Academy of Chemical Sciences of the Academy of Sciences, USSR, and the Department of Chemistry of Moscow State University, and held in Moscow on January 27-30, 1958. Officers of the conference are listed in the Foreword. A list of other reports also read at the conference, but not included in this book, are given. Among the problems treated in this work are: electrolytic solutions, ultrasonic measurement, dielectric and thermodynamic properties of various mixtures, spectroscopic analysis, etc. References accompany individual articles.	
	Shakhparonov, M. I. Present Problems of the Thermodynamic Theory of Solutions of Nonelectrolytes	36
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	Tatarskiy, K. B. Change in Thermodynamic Functions in Reactions of Association of Ions in Solutions	133
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K. M. Y. ...

PHASE I BOOK EXPLOITATION

SOV/3528

Moscow. Dom nauchno-tekhnicheskoy propagandy

Primeneniye ul'trazvuka v promyshlennosti; sbornik statey (Industrial Use of Ultrasound; Collection of Articles) Moscow, Mashgiz, 1959. 301 p. 8,000 copies printed.

Sponsoring Agency: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR.

Ed. (Title page): V.F. Nozdrev, Doctor of Physical and Mathematical Sciences, Professor; Ed. (Inside book): G.F. Kochetova, Engineer; Tech. Ed.: V.D. El'kind; Managing Ed. for Literature on Machinery and Instrument Manufacturing (Mashgiz): N.V. Pokrovskiy, Engineer.

PURPOSE: This book is intended for engineers and technicians engaged in the application of ultrasonics in machinery manufacture and in other branches of industry.

COVERAGE: This is a collection of papers read at the first all-Union conference on the use of ultrasonics in industry. Attention

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Industrial Use (Cont.)

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is focused mainly on the description of ultrasonic equipment and on the use of ultrasound for the machining of hard materials and for flaw detection. The effect of ultrasound on metal-crystallization processes is also discussed. No personalities are mentioned. References accompany many of the papers.

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D'yachenko, P.Ye., Doctor of Technical Sciences, Professor; Yu. N. Mizrokhi, Engineer; and V.G. Aver'yanova. Some Problems in the Ultrasonic Machining of Materials 149

Teumin, I.I., Candidate of Physical and Mathematical Sciences. Effect of Elastic Vibrations on the Crystallization and Processing Properties of Alloys 163

Bagdasarov, Kh.S., Candidate of Chemical Sciences. Effect of Ultrasonic Vibrations on the Process of Crystallization 175

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Grekov, N.A. Methods of Industrial Quality Control of Metal for Turbogenerator Rotor Forgings ("Elektrosila" Plant imeni S.M. Kirov) 267

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Ultrasound in Welding

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AVAILABLE: Library of Congress

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VK/jb  
6-15-60

NOZDREK, V.F., prof., red.; KUDRYAVTSEV, B.B., prof., red.; ZHITOV,  
S.P., tekhn.red.

[Application of ultra-acoustics to studies of the matter]  
Primenenie ul'traakustiki k issledovaniyu veshchestva.  
Pod red. V.F.Nozdreva i B.B.Kudriavtseva. Moskva, Izd.  
MOPI. No.8. 1959. 170 p. (MIRA 12:8)

1. Moskovskiy oblastnoy pedagogicheskiy institut im..Krupskoy (for  
Nozdrev). (Ultrasonic waves)

05218  
SOV/142-2-3-26/27

KUDRYAVTSEV, B.B.  
P.2

9(3,9), 24(1)  
AUTHOR:

TITLE:

Sokolova, Ye.S., Candidate of Technical Sciences  
A Scientific Conference on the Application of Ultrasound in the  
Investigation of Matter

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1959, Vol  
2, Nr 3, p 386 (USSR)

ABSTRACT:

From February 10-14, 1959, the Seventh Scientific Conference on  
the Application of Ultrasound for the Investigation of Matter  
was convened in Moscow at the Moskovskiy Oblast'noy pedagogiches-  
kiy institut, imeni N.K. Krupskoy (Moscow Oblast Pedagogical Insti-  
tute, imeni N.K. Krupskaya). About 500 vuz instructors from the  
Leningrad, Krasnoyarsk, Kaunas, Stalingrad, and scientists from the  
German Democratic Republic and Poland participated in the confer-  
ence work. More than 80 papers were read at the conference: molecular  
following sections were organized at this conference: research methods,  
acoustics, industrial application of ultrasound, demonstration of acous-  
tical phenomena in schools and vuzes. At the first plenary sessi-  
the paper of V.F. Nozdrev was read "Physical Principles of Tech-

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A Scientific Conference on the Application of Ultrasound in the Investigation of Matter

nological Application of Low-Amplitude Molecular Acoustics". B.B. Kudryavtsev read his paper "The Application of Ultrasound in Industry". The following papers were read at the plenary session: A.S. Predvoditelev "The Sound Wave Dispersion in Rarefied Gases"; Dr. Rothard, German Democratic Republic, "Ultrasonic Investigation of Silica Gel and Its Derivatives"; M. Kvek, Poland, "The Application of the Molecular Kinematic Theory of Gases to the Problem of Waves with a Limited Amplitude"; N.S. Akulov, "The Theory of Roschell-type Salts", and a paper of Professor F. Kucher, Poland. Research in the field of ultrasound wave propagation in liquids was the subject of the papers of B.B. Kudryavtsev, S.A. Balyan, L.G. Belinskaya, O.A. Starostina, V.M. Zakurenova, V.D. Kaspar'yants, M.G. Shirkevich, L.F. Vereshchagina, N.L. Bryukhatova, and N.A. Golosova. The paper jointly produced by B.B. Kudryavtsev, V.F. Nozdrev, N.I. Koshkin and V.F. Yakovlev was devoted to the consideration of problems in the development of molecular acoustics. Dr. Rothard delivered a report on the dynamic equation of the state of strongly viscous liquids. The ultrasonic oscillations were subject of the reports of Yu.M. Bystrov, A.N. Trofimov, A.I.

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S/058/60/000/008/009/009  
A005/A001

Translation from: Referativnyy zhurnal, Fizika, 1960, No. 8, p. 348, # 21263

AUTHORS: Kudryavtsev, B.B., Medvedev, A.N., Ponomarev, A.P.

TITLE: The Influence of the Ultrasonic <sup>1</sup> on the Luminescence of Phosphors <sup>1</sup>

PERIODICAL: V sb.: Primeneniye ul'traakust. k issled. veshchestva., No. 9,  
Moscow, 1959, pp. 139-145

TEXT: The authors investigated experimentally (the unit design is presented) the influence of the ultrasonics on the kinetics of luminescence of the light amount stored by phosphors:  $ZnS \cdot CdS \cdot Cu$  and  $ZnS \cdot Cu$ . It turned out that the intensity of the luminescence process of the light amount stored by a luminophor increases with increasing ultrasonic intensity. The enhancing effect of the ultrasonic is caused in the main by the heating of the luminophor in consequence of the acoustic energy absorption. When considering the heating under the ultrasonic effect, it is necessary to take into consideration the local

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S/058/60/000/008/009/009  
A005/A001

The Influence of the Ultrasonic on the Luminescence of Phosphors

temperature increases, which can exceed the average temperature increase of the entire layer of the luminophor.

ASSOCIATION: Mosk. ped. in-t im. Krupskoy (Moscow Pedagogical Institute imeni Krupskaya)

B.B. Kudryavtsev

Translator's note: This is the full translation of the original Russian abstract.

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SOV/69-21-1-8/21

5(4)

AUTHOR: Kudryavtsev, B.B.

TITLE: The Dispersing Action of Cavitation (Dispergiruyushcheye deystviye kavitatsii).

PERIODICAL: Kolloidnyy zhurnal, 1959, Vol, XXI, Nr 1, pp 58-61 (USSR)

ABSTRACT: A study has been made of the dispersion of transformer oil in water under the action of cavitation occurring in the passage of a jet of superheated steam near the water-oil interface. Microphotographs and the corresponding particle-size distribution curves of the emulsion are presented. A simple apparatus is described for the multistep dispersion of liquids, with the aid of which finely-dispersed homogenous emulsions may be obtained. Solids with small cohesive forces between the particles have been shown to be capable of dispersion by a steam-initiated cavitation. There are 2 graphs, 2 diagrams, 1 photo and 8 references, 5 of which are Soviet, 1 American, 1 Canadian, and 1 English.

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